Introduction

How does accommodation factor into sound change?

"(Speakers) accommodate to each other linguistically by reducing the dissimilarities between their speech patterns and adopting features from each other's speech. If a speaker accommodates frequently enough to a particular accent or dialect, I would go on to argue, then the accommodation may become permanent, particularly if attitudinal factors are favorable..." (Trudgill, 1986).

Accommodation requires that speakers be able to:

• Identify how others talk.
• Act on these identifications.

Model

What does the process look like with perfectly accurate identification?

• Population of learners.
• Each learner interacts with k others.
• Proportion of learners with new variant, \( p \).
• Learners adopt majority variant from their experience.
• Calculate proportion of learners with new variant at next point in time, \( p' \).
• Calculate the evolution and stability of \( p \) over time: \( p \rightarrow p' \rightarrow p'' \ldots \)

\[
p' = \sum_{k=1}^{n} (\frac{n}{k}) p^k (1-p)^{n-k}
\]  

(1)

Intuition: Asymmetric errors allow new variant to spread with minority.

Mergers

Why focus on mergers?

• Distinctions are hard to learn (i.e. identify) (Chambers, 1992).
• Mergers spread at the expense of distinctions (Herdig, 1965).
• Notably free from social evaluation (Labov, 1994).

Data

• F1 formant measurements for LOT and THOUGHT vowels for Mid-Atlantic and Inland North male speakers from Atlas of North American English (Labov et al., 2006).

Evaluation

Documented spread of the merger with:

• Influx of merged speakers to Eastern Pennsylvania (ca. 1920, 30 – 50%) (Herold, 1990).
• Influx of merged speakers to Seekonk, MA (ca. 2000, 20 – 30%) (Johnson, 2010).

Conclusions

• Accommodation requires mechanisms of identification and action.
• Misidentification can favor new variants: distinctions are hard, mergers are favored.
• Model of merger-by-misidentification approximates observed thresholds.

References


(4)

(3)

Tipping point, \( p^* \), decreases when probability of mistaking the new variant for the old is negligible (\( c_2 \approx 0 \)) (Niyogi, 2006).

\[
p^* = \frac{1 - c_1}{1 - c_2}
\]

(2)

Methods

Estimate error rate by simulating:

• 100 learners incrementally presented with sets of tokens drawn equally from distributions.
• Fit single Gaussian distribution and two-component Gaussian-mixture model to token set.
• Compare two models according to Akaike’s (1974) Information Criterion (AIC).
• Probability of single Gaussian being better given \( n \) tokens, probability of being given \( n \) tokens.

Figure 3: F1 for LOT and THOUGHT

Figure 4: Fit of single Gaussian (left) and Mixture of Gaussians (right) to data.

Figure 5: Spread of the low-back merger in Eastern Pennsylvania (left) and Massachusetts (right).

Acknowledgements